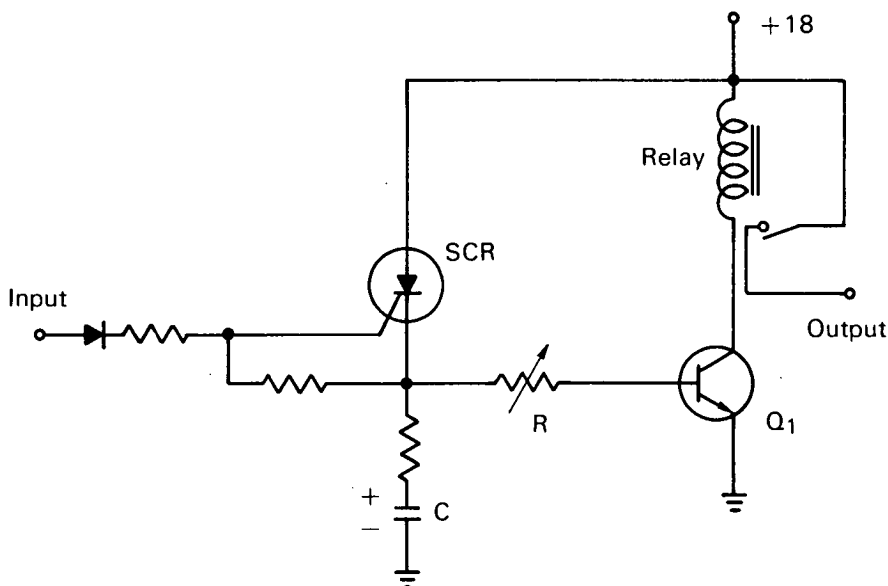


NASA TECH BRIEF



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Long Time Constant Timer Requires No Recovery Time



The problem:

Many circuits for timing are in common use, especially R-C discharge circuits, but all require some recovery period after turnoff before they can be retriggered.

The solution:

A circuit for timing that will deliver relatively long pulses yet requires no recovery time after turnoff. It can even be retriggered before it has timed out and turned off.

How it's done:

When a positive pulse is applied to the input terminal, the silicon controlled rectifier (SCR) is turned on, current flows through it to turn Q_1 on and charge capacitor C. When C is sufficiently charged, current through the SCR drops below its required holding

current level, the SCR turns off and C begins discharging through R into the base of Q_1 . In the meantime, Q_1 , having been turned on, has pulled in the relay that provides the output connection. As C discharges, current in the collector of Q_1 and in the relay starts to decrease until it drops below the relay latching level, at which the relay opens breaking the output connection. The circuit may be retriggered at any time after SCR shutoff, provided the trigger amplitude is sufficiently greater than the charge on C at that time.

Notes:

1. For a given C, the range of times that are available is limited at the low end by that value of R which causes the Q_1 base current to exceed the holding current rating of the SCR; and at the high end by that value of R which will not pass sufficient transistor current to pull in the relay.

(continued overleaf)

2. Timed output pulses of up to a minute or so are obtainable with the circuit as shown. Longer pulses are obtainable by substituting a field effect transistor for Q_1 or by replacing the relay with a Schmitt trigger so that lower base current in Q_1 may be used.

3. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
Greenbelt, Maryland 20771
Reference: B67-10487

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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